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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

MAILED

APR 0 3 2007

GROUP 3600

Application Number: 10/650,208
Filing Date: August 28, 2003
Appellant(s): PHILLIPS ET AL.

Michael D. Wiggins
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 1/05/07 appealing from the Office action mailed 6/09/06.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

This appeal involves claims 1, 3-10 and 12-26.

Claims 2, 11 and 27-29 have been canceled.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is incorrect.

The amendment after final rejection filed on 11/07/06, NOT concurrently filed with the present Appeal Brief, has not been entered.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

| | | |
|---|---|---|
| 5,216,606 | LENTZ ET AL. | 6-1993 |
| 6,715,597 | BUCHANAN ET AL. | 4-2004 |

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

A. Claims 1, 3-10 and 12-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Lentz et al. (USP 5,216,606).

Re: claim 1, Lentz et al. show a cooling system for cooling a friction device, as in the present invention, comprising: a flow control device 82 that controls a flow of cooling fluid through said friction device 14; and a controller 42 that estimates a temperature

state of said friction device based on an estimated heat rate of said friction device by the signal 66 from a temperature sensor, calculates a flow command based on said temperature state and operates said flow control device based on said flow command, as stated in the Abstract.

Re: claim 3, Lentz uses various sensors with output signals 56-62 to determine a friction device torque and a friction device slip speed and calculates said heat rate of said friction device based on said friction device torque and said friction device slip speed signal.

Re: claim 4, Lentz also shows a sump 84 for collecting said flow of fluid; and a sump temperature sensor that generates a sump temperature signal 66, wherein said temperature state is further based on said sump temperature signal.

Re: claim 5, Lentz also shows said temperature state is further based on a current flow command, as shown in box 162 in figure 3b.

Re: claim 6, Lentz shows said flow command is further based on a heat rate of said friction device and a sump temperature of said flow of fluid, as shown in boxes 160, 162 in figure 3b.

Re: claim 7, Lentz shows said flow control device 82 is one of a fixed displacement pump, a variable displacement pump, an on/off valve and a variable opening valve.

Re claims 8 and 9, Lentz shows said temperature state is a temperature of said friction device and is a thermal energy of said friction device, as shown in figure 1.

Re: claim 10, Lentz shows a method of controlling cooling of a friction device, as in the present invention, comprising: estimating a temperature state of said friction device in box 160 of figure 3b based on an estimated heat rate of said friction device as shown in figure 7; calculating a flow command based on said temperature state, and controlling a cooling fluid flow through said friction device based on said flow command in box 170.

Re: claim 12, Lentz uses various sensors with output signals 56-62 to determine a friction device torque and a friction device slip speed and calculates said heat rate of said friction device based on said friction device torque and said friction device slip speed signal.

Re: claim 13, Lentz measures the temperature with a sensor that outputs signal 66.

Re: claim 14, Lentz also shows said temperature state is further based on a current flow command, as shown in box 162 in figure 3b.

Re: claims 15 and 16, Lentz shows said flow command is further based on a heat rate of said friction device and a temperature of said fluid flow, as shown in boxes 160, 162 in figure 3b.

Re: claim 17, Lentz shows figure 3b with box 170 controlling fluid flow as claimed.

Re claims 18 and 19, Lentz shows said temperature state is a temperature of said friction device and is a thermal energy of said friction device, as shown in figure 1.

Re: claim 20, Lentz shows a method of controlling cooling of a friction device, as in the present invention, comprising: calculation a heat rate of said friction device 14 and estimating a temperature sate of said friction device based on said heat rate in box 160 of figure 3b; determining a flow command based on said temperature state and operating a flow control device 82 based on said flow command to control a cooling fluid flow into said friction device 14 in box 170.

Re: claim 21, Lentz uses various sensors with output signals 56-62 to determine a friction device torque and a friction device slip speed and calculates said heat rate of said friction device based on said friction device torque and said friction device slip speed signal.

Re: claim 22, Lentz measures the temperature with a sensor that outputs signal 66.

Re: claim 23, Lentz also shows said temperature state is further based on a current flow command, as shown in box 162 in figure 3b.

Re: claim 24, Lentz shows figure 3b with box 170 controlling fluid flow as claimed.

Re claims 25 and 26, Lentz shows said temperature state is a temperature of said friction device and is a thermal energy of said friction device, as shown in figure 1.

B. Claims 1, 3-10 and 12-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Buchanan et al. (USP 6,715,597).

Re: claim 1, Buchanan et al. show a cooling system for cooling a friction device, as in the present invention, comprising: a flow control device 94 that controls a flow of

cooling fluid through said friction device; and a controller that estimates a temperature state of said friction device based on an estimated heat rate of said friction device as shown in boxes 242 and 256 of figure 3A, calculates a flow command based on said temperature state and operates said flow control device based on said flow command as shown in box 258.

Re: claim 3, Buchanan determines a friction device torque and a friction device slip speed and calculates said heat rate of said friction device based on said friction device torque and said friction device slip speed signal as shown in box 254.

Re: claim 4, Buchanan also shows a sump 90 for collecting said flow of fluid; and a sump temperature sensor that generates a sump temperature signal, wherein said temperature state is further based on said sump temperature signal as shown in box 258.

Re: claim 5, Buchanan also shows said temperature state is further based on a current flow command, as shown in box 256 in figure 3A.

Re: claim 6, Buchanan shows said flow command is further based on a heat rate of said friction device and a sump temperature of said flow of fluid, as shown in box 258 in figure 3A.

Re: claim 7, Buchanan shows said flow control device 94 is one of a fixed displacement pump, a variable displacement pump, an on/off valve and a variable opening valve.

Re claims 8 and 9, Buchanan shows said temperature state is a temperature of said friction device and is a thermal energy of said friction device, as shown in figure 3A.

Re: claim 10, Buchanan shows a method of controlling cooling of a friction device, as in the present invention, comprising: estimating a temperature state of said friction device based on an estimated heat rate of said friction device in boxes 242 and 256 of figure 3A; calculating a flow command based on said temperature state 258, and controlling a cooling fluid flow through said friction device based on said flow command in box 236.

Re: claim 12, Buchanan determines a friction device torque and a friction device slip speed and calculates said heat rate of said friction device based on said friction device torque and said friction device slip speed signal in box 254.

Re: claim 13, Buchanan measures the temperature with a sensor in box 242.

Re: claim 14, Buchanan also shows said temperature state is further based on a current flow command, as shown in box 256 in figure 3A.

Re: claims 15 and 16, Buchanan shows said flow command is further based on a heat rate of said friction device and a temperature of said fluid flow, as shown in box 258.

Re: claim 17, Buchanan shows in figure 3A said step of controlling fluid flow as claimed.

Re claims 18 and 19, Buchanan shows said temperature state is a temperature of said friction device and is a thermal energy of said friction device, as shown in box 242.

Re: claim 20, Buchanan shows a method of controlling cooling of a friction device, as in the present invention, comprising: calculation a heat rate of said friction

device in box 254; estimating a temperature state of said friction device based on said heat rate in box 256; determining a flow command based on said temperature state 258 and operating a flow control device 94 based on said flow command to control a cooling fluid flow into said friction device in box 236.

Re: claim 21, Buchanan determines a friction device torque and a friction device slip speed and calculates said heat rate of said friction device based on said friction device torque and said friction device slip speed signal in boxes 244, 252, 254.

Re: claim 22, Buchanan measures the temperature with a sensor in box 242.

Re: claim 23, Buchanan also shows said temperature state is further based on a current flow command as shown in box 256.

Re: claim 24, Buchanan shows figure 3A controlling fluid flow as claimed.

Re claims 25 and 26, Buchanan shows said temperature state is a temperature of said friction device and is a thermal energy of said friction device in box 258.

**(10) Response to Argument**

*Appellant argues that Lentz's system employs the fluid to actuate the clutch, and have nothing to do with cooling the clutch. Appellant also argues that the Examiner is in error by stating that it is well known for hydraulic fluid to act as a cooling fluid while actuating the clutch because the hydraulic actuator is a separate structure.*

In response to the above argument, the Examiner would like to call attention to the abstract of the patent to Lentz. The last two lines of the abstract states "The **fluid retained in a clutch cavity** from a recent application and not fully exhausted is also

taken into account." From this passage, it is clear that the hydraulic actuator is not a separate structure as argued by Appellant. The hydraulic fluid in the Lentz's system circulates within the clutch cavity. Hence, Examiner's statement of the hydraulic fluid being both an actuating fluid and a cooling fluid is correct. Not only it is well known for hydraulic fluid to serve as an actuating and cooling fluid, cooling the clutch of Lentz while actuating it with a hydraulic fluid would also be an inherent process.

*Appellant argues that Buchanan's system determines bulk clutch temperature change based on measured fluid temperature, hence fails to estimate a clutch temperature based on an estimated heat rate. And, Buchanan uses two temperature sensors instead of one as in the present invention.*

It is maintained that Buchanan anticipates every limitation of the claimed invention. The Examiner is at a lost of Appellant's argument. Claim 1 states "a controller that estimates a temperature state of said friction device based on an estimated heat rate of said friction device, calculates a flow command based on said temperature state and operates said flow control device based on said flow command." Buchanan, in boxes 242, 256 and 258 show clearly that a temperature change (i.e. heat rate) is being determined based on prior cooling flow (i.e. estimation based on a previous value or extrapolation to obtain an estimated figure based on a previous value); and determine the flow required to account for the change in the temperature. Even though Buchanan is not describing their invention using the exact terms that are

being used by Appellant such as heat rate, estimating, etc., Buchanan does anticipate the claimed invention as stated above.

Appellant also argues that Buchanan uses two temperature sensors while the instant invention uses only one. In reviewing claim 1, a limitation for the number of sensors could not be found.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Xuan Lan Nguyen/ 3-15-07

Lan Nguyen

Primary Examiner

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